USING IPTV SERVICES IN DISTANCE LEARNING SYSTEMS

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Abstract:

This paper shows development of Internet Protocol Television (IPTV) services and integration in existing distance learning platform for educational purposes. IPTV offers new approach in teaching and delivering of study materials to students. Students can watch digital course content on various mobile or portable devices like smartphones and tablets over the Internet. The Distance learning platform includes three IPTV services (live video stream, video on demand, Audio Q&A). The result of the Distance learning system and IPTV Distance learning system evaluation found that new IPTV had a higher user satisfaction than old system. Furthermore, an IPTV service creates a good learning experience for the students. This paper provides guidelines how to use IPTV services for education.

INTRODUCTION

Distance learning systems are very popular lately. There are few different platforms like Learning Management Systems (LMS) and Course Management Systems (CMS) with main goal to offer online training courses. Our distance learning system is based on one of the most commonly used in education institutions in the world LMS system called Moodle [1]. Moodle is a GPL open-source learning platform with modular construction and allows plugins for adding new functionality and features.

Main features include:

- Enrollment and registration
- Assignment submission
- Discussion forum
- Files download
- Grading
- Moodle instant messages
- Online quiz
- Activities
- Reports

These features are both plugins and PHP code written by our team to make this system usable by students. Students are not only graded but also tracked how much time they spend logged in and if there is inactivity more than 1 hour they are logged out and no working time is added to their gradebook.

Lectures and study materials are presented in PDF format for students to download or read directly from distance learning system. Activities and exams are scheduled for certain date and time and they appear in the system only for short period of time.

Fig. 1 shows login screen of distance learning system. Every student must obtain username and password to access the system. There cannot be two students with the same username logged in in the system and working online at the same time. If the same user is logged in second time, the first user is automatically disconnected and time spend online for this user is not added to total time spend online.
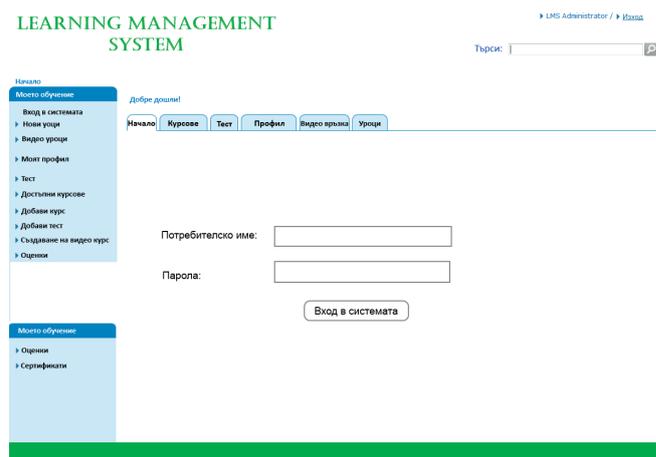
Fig. 1 Example of distance learning system login screen

Reports are generated for time every student spends online and grades from every quiz and exam showed by student or for all students in particular course. Student profile with information about login time, total time online and enrolled courses is presented on Fig. 2.
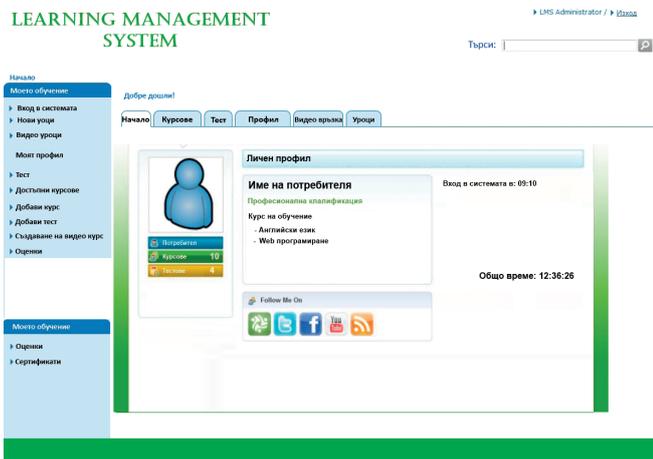
Fig. 2 Example of Student profile screen

Fig 3. New IPTV services in Distance Learning System

However this system does not provide enough interaction between teacher and students. There need to be in person class activities and Q&A sessions. Also class roster is limited to space in one class room and students must be divided in groups to attend in person lectures.

If a student can't attend to these lectures there is no way to get back in track with other students without going to teacher and take private consultation.

We are trying to overcome this by introducing IPTV services to our existing distance learning system.

ADDING IPTV SERVICES

To deliver video content over IP network IPTV system needs interactive services. IPTV services can be divided in three main groups: streaming TV, video on demand (VOD) and time-shifted TV. According to ETSI specification [4] Next Generation Networks integrated IPTV include following IPTV services: Broadcast TV; Content on Demand (nCoD, pCoD); Personal Video Recording (cPVR, nPVR); Pay Per View (PPV); Interactive TV (iTV); User Generated Content (UGC); Profiling and personalization; Content Recommendations (CR); Advertising (Ad) and Targeted Advertising (TAI); Messaging services; Notification services; Personalized channel; Bookmarks or Content Marking (CM).

IPTV services provide students with more control over viewed Video channels and give them ability to make decision what Video content to choose and when to watch it. Student can watch IPTV with a number of network-addressable devices like laptop, personal computer, set-top box and TV, smartphone, tablet, gaming consoles, etc. These features make IPTV suitable for our distance learning system.

IPTV can offer new additions to distance learning systems by introducing following services:

- Live video stream
- Video on demand
- Time Shifted TV / Personal video recording
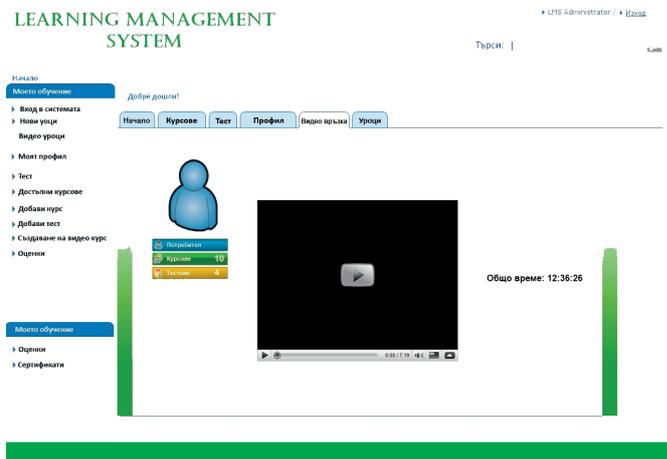
Example for use of each of IPTV services in our distance learning system is shown on Fig. 3 and Table I. Usage of these services is not limited and our system is constantly upgraded with new interactive services for students to use on a daily bases. We get positive feedback from students for added IPTV services.

Table I New services

IPTV Service	Distance Learning System usage
Live video stream	Live video lessons Oral exams Q&A sessions
Video on demand	Video lessons Library Q&A Library
Time Shifted TV / Personal video recording	Pause and resume Live sessions Record live video lessons Record Q&A sessions

CONCLUSION

As IPTV is transmitted over IP it needs proper compression techniques to compress the video prior to its transmission depending on the available bandwidth. We have found H.264/MPEG-4 AVC compression the best possible solution for this challenge. Now students can watch both live video lessons and video on demand recorded lessons.

Students involved in IPTV distance learning system have a high score of system satisfaction.

FUTURE WORK

Our vision for future in distance learning systems includes better integration with IPTV and adding features like mobility and portability so students can gain knowledge via smartphone, tablet or any other portable device. Adding more interactive services and improve student interaction with the system.

ACKNOWLEDGMENT

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